

AMENDMENTS TO THE CLAIMS

1. (previously presented) A thermal barrier coating composition consisting essentially of a cubic matrix structure of ZrO_2 stabilized by a concentration of Y_2O_3 that is at least 30 wt. % and that is greater than that concentration of Y_2O_3 that would result in a peak ionic conductivity in the matrix.

2. (cancelled).

3. (previously presented) The thermal barrier coating composition of claim 1, further comprising at least 40 wt. % Y_2O_3 .

4. (previously presented) The thermal barrier coating composition of claim 1, further comprising at least 50 wt. % Y_2O_3 .

5. (currently amended) A thermal barrier coating composition consisting essentially of a cubic matrix structure of ZrO_2 stabilized by a concentration of Y_2O_3 that is at least 30 wt. %, wherein the concentration of Y_2O_3 is sufficiently high to create a quantity of multi-vacancy defect clusters in the cubic matrix structure such that the material exhibits a resistance to sintering measured as linear shrinkage to be less than 4000 ppm after exposure to 1400 °C. for 24 hours.

6. (previously presented) A thermal barrier coating composition consisting essentially of a cubic matrix structure of a rare earth oxide selected from the group of zirconia, hafnia and titania and containing a stabilizer selected from the group of lanthia, ytterbia and yttria, the material comprising a concentration of the stabilizer that is at least 30 wt. % and that is greater than that concentration of the stabilizer that would result in a peak ionic conductivity in the matrix.

7. (cancelled).
8. (previously presented) The thermal barrier coating composition of claim 6, further comprising at least 40 wt. % stabilizer.
9. (previously presented) The thermal barrier coating composition of claim 6, further comprising at least 50 wt. % stabilizer.
10. (previously presented) A thermal barrier coating composition consisting essentially of a cubic matrix structure of HfO_2 stabilized by a concentration of a rare earth oxide Gd_2O_3 that is at least 30 wt. % and that is greater than that concentration of the rare earth oxide that would result in a peak ionic conductivity in the matrix.
11. (cancelled).
12. (cancelled).
13. (currently amended) The thermal barrier coating composition of claim-~~44~~10, further comprising at least 40 wt. % Gd_2O_3 .
14. (currently amended) The thermal barrier coating composition of claim-~~44~~10, further comprising at least 50 wt. % Gd_2O_3 .